

REMARKS

In the Official Action mailed 23 August 2007, the Examiner reviewed claims 1-4, 6-11, 13-18 and 20-30. The Examiner has rejected claims 23, 24, 26, 27, 29 and 30 under 35 U.S.C. §112, second paragraph; and has rejected claims 1-4, 6-11, 13-18 and 20-30 under 35 U.S.C. §103(a).

Applicant cancels independent claims 1, 8 and 15, and adds new claims 31-39, including independent claims 31, 34 and 37 to replace canceled independent claims 1, 8, and 15. Amendments to all the pending dependent claims except 3, 10 and 17, are made as a consequence of the new independent claims. Also, applicant cancels claims 22-30. Claims 2-4, 6, 7, 9-11, 13, 14, 16-18, 20-21 and 31-39 are now pending.

The rejections are respectfully traversed below and reconsideration is requested.

Rejection of Claims 23, 24, 26, 27, 29 and 30 under 35 U.S.C. §112, second paragraph

The Examiner has rejected claims 23, 24, 26, 27, 29 and 30 under 35 U.S.C. §112, second paragraph. Such claims are canceled.

Rejection of Claims 1-4, 6-11, 13-18 and 20-30 under 35 U.S.C. §103(a)

The Examiner has rejected claims 1-4, 6-11, 13-18 and 20-30 under 35 U.S.C. §103(a) as being unpatentable over Perlman (US 6,363,480), and further in view of Kelly (US 5,636,280).

As mentioned above, independent claims 1, 8 and 15 have been replaced by claims 31, 34 and 37 respectively. Applicant requests reconsideration in view of the remarks submitted 23 October 2007, which are incorporated by reference herein. In addition, substantial clarifying amendments have been entered.

Support for New Claims 31-39

Support in the specification for new claims 31-39 is found in Figures 1, 2, and 3, and in the specification. Copies of such claims with parenthetical references to support in the specification follow:

31. (new) A method for mutual authentication in communications between first and second stations, comprising:

generating and storing a set of ephemeral session keys at the first station, ephemeral session keys in the set being associated with respective session key initiation intervals, and being discarded at a time later than expiration of the respective session key initiation intervals; (SRKs, Fig. 1)

in response to a request (3005, Fig. 3) to initiate a communication session received by the first station during a particular session key initiation interval, selecting the associated session key (SRK_i, Fig. 3);

sending a message carrying said associated session key to the second station (3006, Fig. 3), and receiving a response from the second station including a digital identifier (host ID or user name), ~~which is~~ the digital identifier being information shared between the first station and the second station, or between the first station and a user at the second station, the digital identifier being encrypted using said associated session key to verify receipt of the session key by the second station and to identify the second station or the user of the second station (3007, 3008, Fig. 3);

generating and storing, in the first station, a set of intermediate data keys, the set of intermediate data keys including intermediate data key (i), for $i = 1$ to at least n , and being discarded at a time later than expiration of the particular session key initiation interval; (DRK₁ to DRK_n, Fig. 2)

executing a first set of exchanges (3009-3013, Fig. 3) including one or more exchanges with the second station, after verifying in said first station receipt of the session key by the second station by decrypting the digital identifier using the associated session key at the first station and positively matching the decrypted digital identifier against an existing entry in a stored list of authorized users, the first set of exchanges including

sending a message to the second station carrying intermediate data key (i) from said set of intermediate data keys encrypted using the associated session key for a first exchange in first set of exchanges and using the intermediate data key (i-1) for subsequent exchanges in the first set of exchanges,

receiving a response from the second station including a hashed version of intermediate data key (i) encrypted using intermediate data key (i), ~~and~~ decrypting the hashed version of the intermediate data key (i), calculating a hashed version of intermediate data key (i) at the first station, and matching the

calculated hashed version and the received hashed version of intermediate data key (i) to verify receipt by the second station of intermediate data key (i);

executing a second set of exchanges for mutual authentication after verifying in said first station receipt of the intermediate data key (n-1) by the second station, including

sending a first message carrying intermediate data key (n) encrypted using a hashed version of a first shared secret,

receiving a response from the second station carrying a hashed version of intermediate data key (n) encrypted using a hashed version of the first shared secret, and

decrypting the hashed version of the intermediate data key (n), calculating a hashed version of intermediate data key (n) at the first station, and matching the calculated hashed version and the decrypted hashed version of intermediate data key (n) to verify possession by the second station of the first shared secret (3014, Fig. 3);

sending a second message carrying intermediate data key (n) encrypted using a hashed version of a second shared secret; and

if the second station sends a response to the second message, carrying a hashed version of intermediate data key (n) encrypted using a hashed version of the second shared secret, after possession by the first station of the second shared secret is verified at the second station, the verifying being accomplished at the second station by decrypting the intermediate data key (n) from the second message using the hashed version of the second shared secret, calculating a hashed version of the intermediate data key (n), and matching the calculated hashed version and the decrypted hashed version of intermediate data key (n) to verify possession by the first station of the second shared secret (3015, Fig. 3), then

receiving the response from the second station, and decrypting the hashed version of the intermediate data key (n) using the hashed version of the second shared secret, calculating a hashed version of intermediate data key (n) at the first station, and matching the calculated hashed version and the decrypted hashed version of intermediate data key (n) at the first station to verify mutual authentication of the first and second stations (3015, Fig. 3); and

if mutual authentication is verified at the first station, then sending a message indicating successful authentication (3016, Fig. 3).

32. (new) The method of claim 31, wherein said message indicating successful authentication carries a signal encrypted using intermediate data key (n-1) or using another prearranged one of said intermediate data keys (i) (3016, Fig. 3).

33. (new) The method of claim 31, including using intermediate data key (n) as a symmetrical key to encrypt data during post-authentication ~~in~~ communications between the first and second stations in the communication session (FSK, paragraph [0051]).

34.(new) A data processing apparatus, comprising:
a processor associated with a first station, a communication interface adapted for connection to a communication medium, and memory storing instructions for execution by the data processor, the instructions including
logic to receive a request via the communication interface for initiation of a communication session between a first station and a second station;
logic to provide for mutual authentication in communications between the first station and a second station, comprising:
generating and storing a set of ephemeral session keys at the first station, ephemeral session keys in the set being associated with respective session key initiation intervals, and being discarded at a time later than expiration of the respective session key initiation intervals; (SRKs, Fig. 1)
in response to a request (3005, Fig. 3) to initiate a communication session received by the first station during a particular session key initiation interval, selecting the associated session key (SRKi, Fig. 3);
sending a message carrying said associated session key to the second station (3006, Fig. 3), and receiving a response from the second station including a digital identifier (host ID or user name), ~~which is~~ the digital identifier being information shared between the first station and the second station, or between the first station and a user at the second station, the digital identifier being encrypted using said associated session key to verify receipt of the session key by the

21 second station and to identify the second station or the user of the second station (3007, 3008,
22 Fig. 3);

23 generating and storing, in the first station, a set of intermediate data keys, the set of
24 intermediate data keys including intermediate data key (i), for $i = 1$ to at least n , and being
25 discarded at a time later than expiration of the particular session key initiation interval; (DRK1 to
26 DRKn, Fig. 2)

27 executing a first set of exchanges (3009-3013, Fig. 3) including one or more exchanges
28 with the second station, after verifying in said first station receipt of the session key by the
29 second station by decrypting the digital identifier using the associated session key at the first
30 station and positively matching the decrypted digital identifier against an existing entry in a
31 stored list of authorized users, the first set of exchanges including

32 sending a message to the second station carrying intermediate data key (i) from said
33 set of intermediate data keys encrypted using the associated session key for a
34 first exchange in first set of exchanges and using the intermediate data key (i-
35 1) for subsequent exchanges in the first set of exchanges,

36 receiving a response from the second station including a hashed version of
37 intermediate data key (i) encrypted using intermediate data key (i), ~~and~~
38 decrypting the hashed version of the intermediate data key (i), calculating a
39 hashed version of intermediate data key (i) at the first station, and matching the
40 calculated hashed version and the received hashed version of intermediate data
41 key (i) to verify receipt by the second station of intermediate data key (i);

42 executing a second set of exchanges for mutual authentication after verifying in said first
43 station receipt of the intermediate data key (n-1) by the second station, including

44 sending a first message carrying intermediate data key (n) encrypted using a hashed
45 version of a first shared secret,

46 receiving a response from the second station carrying a hashed version of intermediate
47 data key (n) encrypted using a hashed version of the first shared secret, and
48 decrypting the hashed version of the intermediate data key (n), calculating a
49 hashed version of intermediate data key (n) at the first station, and matching
50 the calculated hashed version and the decrypted hashed version of intermediate

51 data key (n) to verify possession by the second station of the first shared secret
52 (3014, Fig. 3);
53 sending a second message carrying intermediate data key (n) encrypted using a hashed
54 version of a second shared secret; and
55 if the second station sends a response to the second message, carrying a hashed
56 version of intermediate data key (n) encrypted using a hashed version of the
57 second shared secret, after possession by the first station of the second shared
58 secret is verified at the second station, the verifying being accomplished at the
59 second station by decrypting the intermediate data key (n) from the second
60 message using the hashed version of the second shared secret, calculating a
61 hashed version of the intermediate data key (n), and matching the calculated
62 hashed version and the decrypted hashed version of intermediate data key (n)
63 to verify possession by the first station of the second shared secret (3015, Fig.
64 3), then
65 receiving the response from the second station, and decrypting the hashed version of
66 the intermediate data key (n) using the hashed version of the second shared
67 secret, calculating a hashed version of intermediate data key (n) at the first
68 station, and matching the calculated hashed version and the decrypted hashed
69 version of intermediate data key (n) at the first station to verify mutual
70 authentication of the first and second stations (3015, Fig. 3); and
71 if mutual authentication is verified at the first station, then sending a message indicating
72 successful authentication (3016, Fig. 3).

1 35. (new) The apparatus of claim 34, wherein said message indicating successful
2 authentication carries a signal encrypted using intermediate data key (n-1) or using another
3 prearranged one of said intermediate data keys (i) (3016, Fig. 3).

1 36. (new) The apparatus of claim 34, including using intermediate data key (n) as a
2 symmetrical key to encrypt data during post-authentication communications between the first
3 and second stations in the communication session (FSK, paragraph [0051]).

1 37. (new) An article, comprising:

2 machine readable data storage medium having computer program instructions stored
3 therein for establishing a communication session on a communication medium between a first
4 data processing station and a second data processing station having access to the communication
5 medium, said instructions comprising

6 logic to receive a request via the communication interface for initiation of a
7 communication session between a first station and a second station;

8 logic to provide for mutual authentication in communications between the first station
9 and a second station, comprising:

10 generating and storing a set of ephemeral session keys at the first station, ephemeral
11 session keys in the set being associated with respective session key initiation intervals, and being
12 discarded at a time later than expiration of the respective session key initiation intervals; (SRKs,
13 Fig. 1)

14 in response to a request (3005, Fig. 3) to initiate a communication session received by the
15 first station during a particular session key initiation interval, selecting the associated session key
16 (SRK_i, Fig. 3);

17 sending a message carrying said associated session key to the second station (3006, Fig.
18 3), and receiving a response from the second station including a digital identifier (host ID or user
19 name), ~~which is~~ the digital identifier being information shared between the first station and the
20 second station, or between the first station and a user at the second station, the digital identifier
21 being encrypted using said associated session key to verify receipt of the session key by the
22 second station and to identify the second station or the user of the second station (3007, 3008,
23 Fig. 3);

24 generating and storing, in the first station, a set of intermediate data keys, the set of
25 intermediate data keys including intermediate data key (i), for $i = 1$ to at least n , and being
26 discarded at a time later than expiration of the particular session key initiation interval; (DRK₁ to
27 DRK_n, Fig. 2)

28 executing a first set of exchanges (3009-3013, Fig. 3) including one or more exchanges
29 with the second station, after verifying in said first station receipt of the session key by the
30 second station by decrypting the digital identifier using the associated session key at the first
31 station and positively matching the decrypted digital identifier against an existing entry in a

32 stored list of authorized users, the first set of exchanges including
33 sending a message to the second station carrying intermediate data key (i) from said
34 set of intermediate data keys encrypted using the associated session key for a
35 first exchange in first set of exchanges and using the intermediate data key (i-
36 1) for subsequent exchanges in the first set of exchanges,
37 receiving a response from the second station including a hashed version of
38 intermediate data key (i) encrypted using intermediate data key (i), ~~and~~
39 decrypting the hashed version of the intermediate data key (i), calculating a
40 hashed version of intermediate data key (i) at the first station, and matching the
41 calculated hashed version and the received hashed version of intermediate data
42 key (i) to verify receipt by the second station of intermediate data key (i);
43 executing a second set of exchanges for mutual authentication after verifying in said first
44 station receipt of the intermediate data key (n-1) by the second station, including
45 sending a first message carrying intermediate data key (n) encrypted using a hashed
46 version of a first shared secret,
47 receiving a response from the second station carrying a hashed version of intermediate
48 data key (n) encrypted using a hashed version of the first shared secret, and
49 decrypting the hashed version of the intermediate data key (n) , calculating a
50 hashed version of intermediate data key (n) at the first station, and matching
51 the calculated hashed version and the decrypted hashed version of intermediate
52 data key (n) to verify possession by the second station of the first shared secret
53 (3014, Fig. 3);
54 sending a second message carrying intermediate data key (n) encrypted using a hashed
55 version of a second shared secret; and
56 if the second station sends a response to the second message, carrying a hashed
57 version of intermediate data key (n) encrypted using a hashed version of the
58 second shared secret, after possession by the first station of the second shared
59 secret is verified at the second station, the verifying being accomplished at the
60 second station by decrypting the intermediate data key (n) from the second
61 message using the hashed version of the second shared secret, calculating a
62 hashed version of the intermediate data key (n), and matching the calculated

63 hashed version and the decrypted hashed version of intermediate data key (n)
64 to verify possession by the first station of the second shared secret (3015, Fig.
65 3), then
66 receiving the response from the second station, and decrypting the hashed version of
67 the intermediate data key (n) using the hashed version of the second shared
68 secret, calculating a hashed version of intermediate data key (n) at the first
69 station, and matching the calculated hashed version and the decrypted hashed
70 version of intermediate data key (n) at the first station to verify mutual
71 authentication of the first and second stations (3015, Fig. 3); and
72 if mutual authentication is verified at the first station, then sending a message indicating
73 successful authentication (3016, Fig. 3).

1 38. (new) The apparatus of claim 37, wherein said message indicating successful
2 authentication carries a signal encrypted using intermediate data key (n-1) or using another
3 prearranged one of said intermediate data keys (i) (3016, Fig. 3).

1 39. (new) The apparatus of claim 37, including using intermediate data key (n) as a
2 symmetrical key to encrypt data during post-authentication communications between the first
3 and second stations in the communication session (FSK, paragraph [0051]).

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CONCLUSION

It is respectfully submitted that this application is now in condition for allowance, and such action is requested.

The Commissioner is hereby authorized to charge any fee determined to be due in connection with this communication, or credit any overpayment, to our Deposit Account No. 50-0869 (AIDT 1005-1).

Respectfully submitted,

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